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Strategic Facilities Management Using Public Private Funding for Energy Projects: A Case Study

Presented by:

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Presentation Overview

- Building Energy Stock & Projections (United States)
- Funding Options (United States)
- Texas, LoanSTAR Program
- Case Study: Alamo Colleges Energy Cost Reduction Projects
- Discussion and/or Questions

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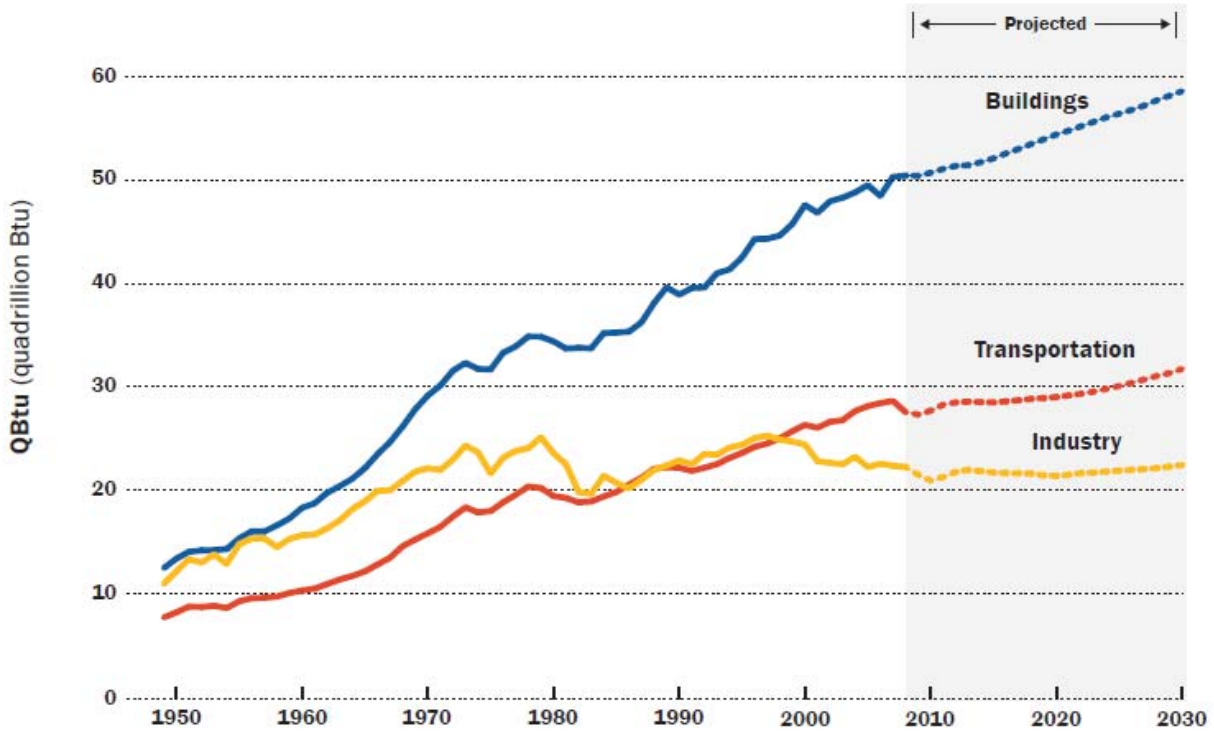
Energy Consumption by Sector Historic / Projected



Source: Graph Presented in 2030 Challenge, www.architecture 2030.org
based on data from the U.S. Energy Information Administration

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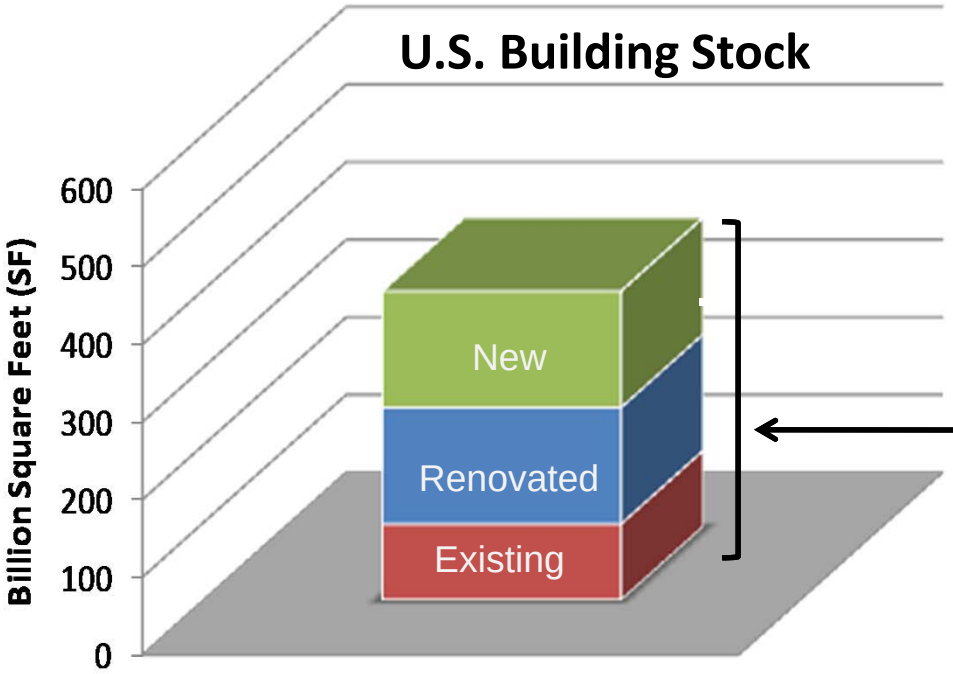
U.S. Building Stock



Source: Graph Presented in 2030 Challenge, www.architecture 2030.org based on data from the U.S. Energy Information Administration

By year 2035, three quarter of the U.S. Building Stock will be new or renovated.

Buildings offer the greatest opportunity for Energy Conservation.

Historic opportunity to improve energy efficiency and promote sustainable building practices.

Energy Projects Funding Options (United States)

- Internal Funding
- Bond (Construction)
- Energy Bonds
- Performance Contracting
- Municipal Tax Free Lease
- Grant
- Rebates
- Lending Institutions (Local Banks etc.)
- Texas State Energy Conservation Office (SECO – LoanSTAR Program) - Texas
- Combination of the above options

Texas, LoanSTAR Program

The Texas LoanSTAR (Saving Taxes and Resources) program finances energy efficient retrofits for state agencies, universities, colleges, public schools, county hospitals, and local government. Program's revolving loan mechanism allows borrowers to repay loans through the stream of cost savings realized from the projects.

- Started as an approved demonstration program in 1988/89 by Department of Energy (DOE)
- Administered by the State Energy Office now known as Texas **S**tate **E**nergy **C**onservation **O**ffice (SECO)
- Initial funding source-Petroleum Violation ESCROW funds
- Mid 90's demonstration label removed from the program

LoanSTAR Program (cont.)

- Funding Application
  - First come first serve basis (*Previously*)
  - Notice of Loan Fund Availability Announcement (*Currently*)
- Interest rate to be determined with each announcement
- Maximum composite loan repayment period is 10 years
  - All projects composite payback must be 10 years or less
  - Individual measure payback must be less than useful life of equipment/measure
- Loan maximum is $5 million dollars per application
- May apply for new loan if repaying an existing loan
- SECO conducts 3 party review at no costs for quality control

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LoanSTAR Program (cont.)

Eligible Projects

- Energy efficient lighting
- Heating, Ventilation and Air-Conditioning systems (HVAC)
- Energy Management Control Systems
- Building shell improvements
- Water conservation projects
- Renewable
- Commissioning per guidelines
- Utility $ Savings is a primary criterion for a project to be considered eligible

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LoanSTAR Program (cont.)

- Detailed Assessment Report must follow LoanSTAR technical guidelines, report review by SECO
- Once technical review is complete and report approved only then LoanSTAR contract executed between borrower and SECO
- SECO reviews and approves design specifications at 50% and 100% complete. SECO conducts on-site construction monitoring at 50% and 100% complete.

LoanSTAR Program (cont.)

Program Performance

- Number of loans – 212
- Number of loan defaults - 0
- Volume of loans - $305,332,224
- Cumulative energy savings
  - $355,762,062 (thru March 2012)
- Cumulative emissions savings
  - Nitrogen oxides 11,024 tons
  - Carbon dioxide - 3,611,090 tons
  - Sulfur dioxide - 7,918 tons
  - Mercury – 0.05 tons

Case Study: Alamo Community College

- Classical example of short and long range planning
  - Use all available resources
  - Operation Cost control
  - Improve comfort
  - Organized effort started a decade ago & continue today
  - Commitment
    - Board of trustees, top management and facilities operational & maintenance staff
  - Team
    - Facilities, Maintenance & Operation Department
      - John W. Strybos, P.E., Associate Vice Chancellor for Facilities
    - Consultant(s) and vendor(s) pool

Case Study: Alamo Community College

- **2002-2004**: **22** Energy Cost Reduction Measures (ECRM) implemented at San Antonio College (SAC), St. Philip's College (SPC) and Palo Alto College (PAC)

- Measures included: lighting and motion sensors, package HVAC systems upgrades, St. Philip's cooling tower upgrade, Energy Management System (EMS) upgrades, Continuous Commissioning®, Variable Frequency Drive (VFD) and booster pump installation.

- Simple payback of individual projects ranging from 3 to 22 years.

- Measured savings indicated actual payback of 6 years compared to projected payback of almost 7 years.

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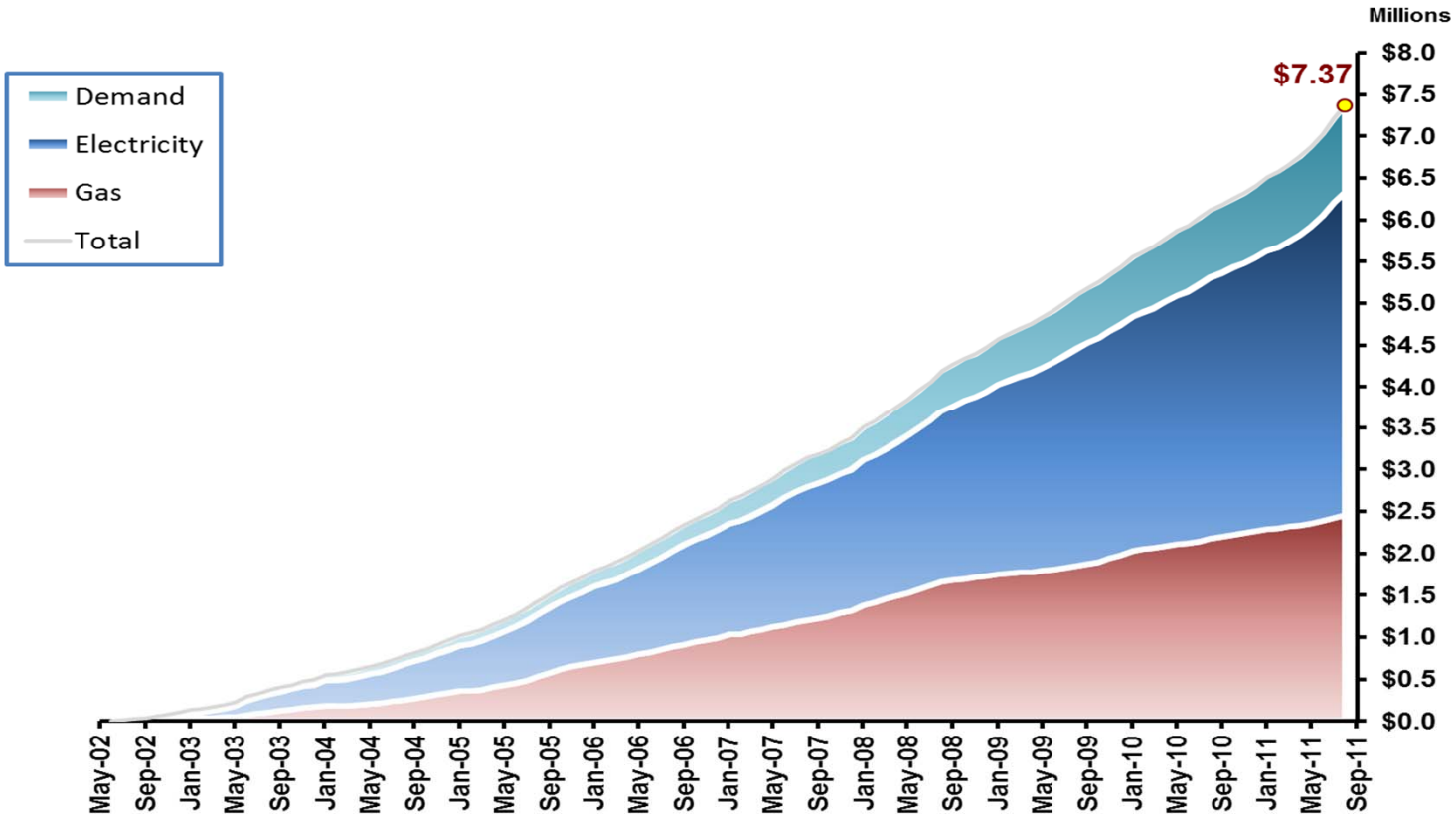
Case Study: Alamo Community College (cont.)

- Loan Amount = $3,076,207.00
- Interest Payments = $ 436,831.76
- Total Amount = $3,513,038.76
- Interest Rate = 3.84%
- Loan Repayment = $41,821.89 per month * 84 months = $3,513,038.76
- Loan funds provided by Bank One
- Loan Repayment period = January 2003 through December 2009
- Loan Repayment source = Utility budget from Utility Savings from ECRM Projects

Case Study: Alamo Community College (cont.)



(Courtesy, ACCD and Energy Systems Lab.)

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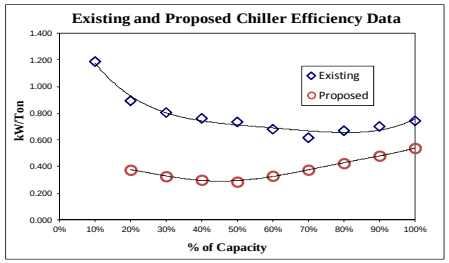
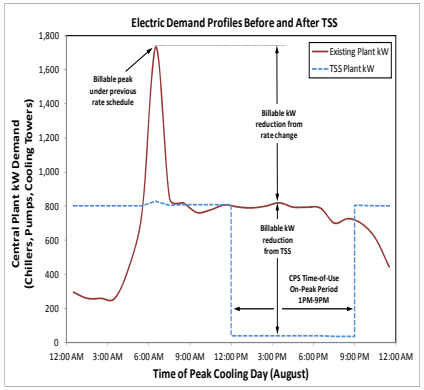
Case Study: Alamo Community College (cont.)

- LoanSTAR – Phase – I
  - Projects: Indoor lighting upgrades, central plant upgrades (*controls, chilled and heating water systems*), solar thermal pool heating, electric rate change and thermal energy storage system (*demand shift - water based*)
    - Approved Funding Amount = $4,99,975 million
    - Savings = $498,421
    - Payback = 10.0 years
    - Interest Rate = 3.0%





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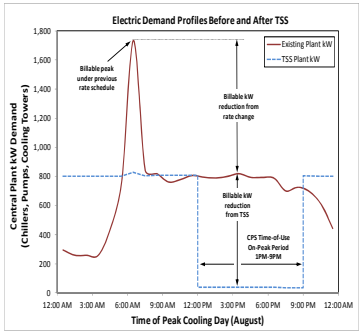
Case Study: Alamo Community College (cont.)

- LoanSTAR – Phase – II
  - Outdoor lighting upgrades, electric rate change, thermal energy storage (*demand shift - water based*), controls upgrades and commissioning (*new construction commissioning, system verification check and functional testing , upgrades, fine tuning with programing changes for dynamic system and quality assurance*)
    - Approved Funding Amount = $4,815,464 million
    - Savings = $481,851
    - Payback = 10.0 years
    - Interest Rate = 1.0%



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Case Study: Alamo Community College (cont.)

- LoanSTAR – Phase I & II
  - 4.3 million square feet
    - $10 million in energy cost reduction projects
  - Projects in implementation phase
  - 12 – 18 months from start to finish (February 2014)
    - May of 2013 (Phase-I)
    - February 2014 (Phase-II)
  - Cumulative simple payback of 10 years
  - Interest rate 3% (Phase-I) and 2.5% (Now 1%, Phase-II)

Case Study: Alamo Community College (cont.)

SUMMARY OF PROJECT (Combined Phase I and II)		
	Total	
kWh Savings	13,190,082	kWh/yr
Demand Savings	44,297	kW-mo/yr
Gas Savings	8,589	MCF/yr
Total MMBTU Savings	53,851	MMBTU/yr
Utility Cost Savings	**$980,273**	**$/yr**
Base Year Cost Reduction	17%	%
Est. Annual Greenhouse Gas Emission Reduction (CO_2)	**9,265**	**Tons**
Est. Mitigated Power Generation Capacity	**4.1**	**MW**
Implementation Costs	$9,815,439	$
Simple Payback	10	Years

Case Study: Alamo Community College (cont.)

- Availability and access to public and private loan funding programs can play a vital role in providing facilities management departments a means to upgrade aging equipment through a stream of energy savings

- Obstacles such as economic uncertainties and perceived risk often discourage participation

  - Careful selection of a technical team to represent Owners throughout the process and clear but flexible loan program guidelines are all critical to overcoming these hurdles

- Alamo Colleges - ***"Strategic use of energy funding programs to help reduce operating costs and spur economic development while positively impacting the environment"***

Discussion and/or Questions?

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